



MONTGOMERY COUNTY FIRE AND RESCUE SERVICE

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May 13, 2020

TO: All Credentialed MCFRS Clinicians

FROM: Roger M. Stone MD, MS
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SUBJECT: Clarification and Update to EtCO₂ and Airway Management During Cardiac Arrest – COVID-19 Standards of Care

As you may know, the QA/QI offices constantly review all high priority calls. After our recent clinical practice changes, we have reports that the EtCO₂ FilterLine sensor may produce very low or zero end tidal CO₂ readings when placed in-line with the BVM and HEPA filter. It is important to note that this sensor is typically used for intubated patients. This issue has caused us to review our pandemic airway management procedures overall. We've spoken to folks outside MCFRS including industry experts and here's where we stand with regard to changes and clarifications.

Airway Management

- The airway management recommendations for cardiac arrests are staying the same. As a reminder from Dr. Stone's standards of care letter dated April 12, the set-up should include an airway adjunct, nasal cannula oxygen, CPAP mask with head strap, HEPA filter, and BVM.
- When delivering 6-10 gentle breaths per minute, the goal is to deliver enough tidal volume and pressure to observe chest rise but not enough to distend the stomach or break the seal between the mask and face.
- When using the head straps in lieu of manual maintenance of the facemask seal, it's easy to forget the basics of patient positioning. The airway must be kept open with an adjunct and the head tilted back.

EtCO₂

- Instead of placing the FilterLine sensor in-line with the BVM and HEPA filter, use the Smart CapnoLine (nasal) EtCO₂ sensor under the sealed CPAP mask. This should provide a more accurate reading in the context of a cardiac arrest, as the gas collection will occur closer to the patient. When possible, place the nasal sensor simultaneously with the application of the CPAP mask and connect a second oxygen cylinder flowing 5L/min.
- EtCO₂ readings are always more accurate when obtained from an intubated patient and we should expect lower EtCO₂ readings when monitoring a non-intubated patient. Intubation is not indicated solely to obtain a more reliable EtCO₂.
- EtCO₂ readings will be zero or very low unless the patient is being adequately ventilated. Passive oxygenation without good BVM ventilation is unlikely to produce any EtCO₂ readings.

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Intubation

Aerosol generating procedures pose the highest risk of SARS-CoV-2 transmission to clinicians. Chest compressions produce aerosols and intubating during chest compressions would pose a very high risk; therefore, chest compressions must be stopped when intubating under pandemic standards of care.

We say this with some reservation as we know that one of the most critical components of cardiac arrest resuscitation is high-quality, continuous chest compressions. The pause required to perform a safe intubation will result in the need to rebuild perfusion pressure. This pause could result in poorer outcomes, especially when this pause occurs in the early part of a resuscitation when a patient is most viable. Therefore, I'm updating our intubation best practices as follows:

- Endotracheal intubation should be avoided but may be necessary when there is evidence that BVM alone is not achieving ventilation (i.e. failure to observe chest rise when bagging), or the airway is in danger of becoming compromised by vomitus, etc.
- Intubation should only occur after the 3rd epinephrine has been administered unless otherwise indicated by an arrest resulting from a primary respiratory problem (e.g. choking, drowning, asthma).
- The patient must be positioned and all equipment assembled prior to intubation. The goal is to achieve rapid first pass success with a minimum pause in chest compressions.
- Chest compressions must be paused and nasal oxygen flow must be stopped prior to removal of the CPAP mask. Chest compressions will only be resumed when both the ET tube cuff is inflated and the HEPA filter is in place.
- Video laryngoscopy should be used to place distance between the clinician and the airway.
- The clinician with the most video laryngoscopy experience should perform the intubation.

If you have any questions, please contact your duty officer.